G. R. S. 59]

GENERAL AND REVENUE SECRETARIAT.

19 11-12

(General Dno.)

P. 50

File No. 211 — 11

Serial Nos. 1 to 21

Papers Filed.

Month July 1913.

SUBJECT.

Specification of an application for "Improvements in the extraction of metals from their ores by Mr. Hugh Mackenzie, Metallurgical Engineer, Glasgow.

PREVIOUS REFERENCES	LATER REFERENCES.

Manuscript
H. Srinivasa Murti. 7. 4. 13.

3050

G.R.S.11] 1911-12

GENERAL AND REVENUE SECRETARIAT

(Gen : Mis)

NOTES.

Gen File No. 211 11/12

FILE HEADING.

Invention for "Improvements in the extraction of metals from their ores" by Mr. Hugh Mackenzie Leslie, Metallurgical Engineer, 53 Waterloo Street, Glasgow, Scotland.

From

Messrs Remfry & Son, Solicitors and Patent Agents, Calcutta.

No. letter Dated 19. 1. 12 Received 22. 1. 12.

Diary No. 3050	Enclos. 2	Spare Copies	Serial No. 1

BRIEF ABSTRACT OF LETTER.

Forwards an application for leave to file a specification of the invention and also a Power of Attorney and remits Rs 11/ therefor

NOTES AND ORDERS.

The amount has been received. Vide coupon put up in Gen. File No. 210 of 1911-12.

The usual drafts are submitted.

27.1.12 VS. 41

Secy 29.1.12

NOTES—First sheet

GPB—30,000—3-4-07.

G. R. S. 12]
General and Revenue Secretariat.

G. M File No. 211 of 1911-12

3581B.

Serial No.	
2	To. Messrs Remfry & Son, Calcutta No G 4356 dt 21.2.12. Requests that an authenticated copy of the order passed in the corresponding application in the United Kingdom may be furnished to this office for reference.
3.	To. The State Geologist. No G 4357 dt 21.2.12 Encl Forwards for report the application received with the Encl.
4	To. The Supdt of Stamps No G 4358 dt 21.2.12 Encl 1 of Re 1/- Forwards for return with the revenue stamps cancelled on it, the Power of Attorney received with Encl 1.
5	To. Dy Comm Bangalore No G 4359 dt 21.2.12 Rs 10/- Forwards Rs 10/- and requests acknowledgment.
6	From the Supdt of Stamps No 110 dt 22-2-12. Returns duly stamped the power-of-attorney forwarded with Encl 4 and requests acknowledgment. Draft submd 29.2.12 VS. 41 29.2.12

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

G. R. File No. 211 of 1911-12

Serial No.	
	311
7	To The Superintendent of Stamps No G 4675 dt 8.3.12 Acknowledges the receipt forward of the stamped Power of Attorney forwarded with the above
8	From the DC Bangalore No 140 dt 23.2.12 Acknowledges the receipt of the amount forwarded with Sl 5 The report of the State Geologist called for in Sl 3 may be awaited Subd GA 99 8.3.12 VS. 4/ 8/3/12
9	From the State Geologist No 1832 dt 30.3.12 Forwards copy of letter No 653 dt 26.3.12 from the Inspector of Mines, stating that there is nothing to prevent the applr for leave to file the specification from being granted. A reply to Sl 2 may be awaited 4311 H T Subd GA 99 10.4.12 VS. 4/ 13/4/12
10	From Messrs Remfry & Son - dt 26.2.13 As called for in Sl 2, forwards a certified copy of British Printed Specifn. From Sl 9, it will be found that the State Geologist recommends the grant of the leave applied for. Draft

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]

General and Revenue Secretariat.

Gen File No. 211 of 1911-12

24752

Serial No.

Subd. PR
9/499
12.3.13

Issue
hm
18/3/13.

11 To. Mr. Hugh Mackenzie Leslie, Metallurgical Engineer 253, Waterloo Street Glasgow. G. 5616 D/18.3 Authorizes him to file a Specification of the invention referred to

12. To Messrs Rempfry & Son Calcutta G. 5617 D/18.3.13. Forwards the above for communication to the party Concerned

13 From Messrs Rempfry & Son. D 13.5.13.

Forwards Rs 30/- and 4 copies of the specification and requests the filing of the Specfn.

This application having been made within 6 months from the date of granting authority to file the specification, is in time. The usual drafts are subd. The ~~Order granted~~ Certificate at the foot of the order granting the authority requires signature (both in draft & fair)

Subd
9/499
31.5.13

Issue
31/5

NOTE—Contn. sheet.

GPB—20,000—20-1-12

F. R. S. 12]

General and Revenue Secretariat.

G. M File No. 211 of 1912

6910
6916
6933

Serial No.	
14	To. The Compiler. G 7859 dt 6.6.13. Notifies the filing of the specification refd to.
15.	To Messrs Remfry & Son G. 7860 dt 6.6.13 Forwards copy of the above for communication to the party concerned & returns Sl 11 with the certificate at foot duly filled in & signed.
16	To. The D. C. Dry. Dept. Bangalore G. 7861 dt 6.6.13. Forwards Rs 30/- received with Sl 13 and requests ackt.
17.	To. The Chief Engineer, Supdt Govt Museum & the State Geologist. G. 7862-4 dt 6.6.13. Forwards for record in their offices, a copy of the specification received with Sl 13 & requests ackt.
18	From the D.C. Dry, Bangalore. No. 48/275 dt 7-6-13 Acknowledges the receipt of the amount forwarded with Sl. 16.
19.	From the State Geologist. No. 2897 dt 9.6.13.
20	From the Supdt, Govt museum. No. 303 dt 9.6.13 Acknowledge the receipt of the specification forwarded with Sl. 17.

The Chief Engineer's reply may be awa

Subd 18/6/13

19/6

NOTE—Contn. sheet.

GPB—65,000—17-6-12.

(5)

G. R. S. 12]

General and Revenue Secretariat. | GM File No. 211 of 1911-12

Serial No.	
21	From the Chief Engr. No. 5564 dt. 4-7-13. Acknowledgt. receipt of the Specification sent with SE-17. The correspondence will be filed here if approved. H. 25-7-13 NR.

yes
Inspector 7

File
26-7-13.

NOTE—Contn. sheet.

GPB—6⁵,000—'7-6-12.

(1)

DIARY No. 3050

GENERAL.

√
22/1 To

1911-1912
Petition for Mis
FILE No. 211 of 1911-12

THE ~~PATENT~~ SECRETARY, to the Govt. of Mysore,
~~PATENT OFFICE~~, Genl & Rev. Dept.
~~CALCUTTA~~ Bangalore,
MYSORE.

FROM
REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

Dated CALCUTTA, the 19th January 1912.

Sir,

"Case B"

We have the honour to forward herewith an Application of HUGH MACKENZIE LESLIE, Metallurgical Engineer, of 53 Waterloo Street, Glasgow, Scotland, for leave to file a Specification under Part I of the Mysore Inventions and Designs Regulation, 1894, in respect of an Invention for "Improvements in "the extraction of metals from their ores", and solicit the favour of your submitting the same to H. H. the Dewan.

The Power of Attorney under which we are acting is also forwarded and we request that it be stamped Re. 1/-.

A Post Office Order for Rs. 11/- is sent today. The corresponding British Application is No. 28235/11 and, we believe there is no corresponding Indian Application.

Kindly give this Application a Register No. later than to the Application in the same name marked "case A" submitted today.

We have the honour to be,
Sir,
Your very obedient servants,

REMFRY & SON.

I.M.B.

1,000.—17-3-11.

34454

2

4 Diffs

G.R.S. 26]

Gen File No. 211 11/12

Serial No. 2

Diary No. of letter replied to 3050

No. G 4356

General and Revenue Secretariat

( )

, *the* 19 .

To

Messrs Remfry & San,

Solicitors & Patent Agents, Calcutta

Date of issue 21-2-12

Signed by Mr Ramaswamayya

Gentlemen,

With reference to your letter of the 19th Jan.y 1912, forwarding an appln for leave to file a specifn of an invention for "Improvements in the extraction of metals from their ores" by Mr. Hugh Mackenzie Leslie of Glasgow, I am directed to request that an authenticated copy of the order passed on the corresponding appln stated to have been made in the United Kingdom, may be obtained

over.

SUBJECT.

and forwarded to this office for reference

I have &c,

WJ 28.1.12

for the Secretary

VS. 41

List of enclosures,

Copied by RJ 1/2

Examined by

GPB—20,000—23-9-10

3(4)for 4

G.R.S. 29A] 4 Pgs (4

190

From

The Asst **Secy. to the Govt. of His Highness The Maharaja of Mysore, Genl. and Rev. Dept.**

To

The State Geologist in Mysore

Dated

Despatched 21. 2. 12

Received

General No. G 435-7

No. G.M.-211-11-3

ENCLOSURE No. are.

Has the honr to forward herewith for report under sec 6 cl(2) of the Mysore Inventions and Designs Regn. XI of 1894 an applin for leave to file a specification of an invention for "Improvements in the extraction of metals from their ores" by Mr. Hugh Mackenzie Leslie of Glasgow.

2. The applin may be returned along with the report called for above.

By Order,

19.1.12

For Asst Secretary

US. 41

GPB—10,000—9-4-06.

Journal Cover
III
22/1/12

G.R.S. 29A] 1285

190

From

The Secy. to the Govt. of His Highness
The Maharaja of Mysore,
Genl. and Rev. Dept.

To

The Superintendent
of Stamps

Dated Bangalore

Despatched 21. 2. 12

Received

General No. G 435-8
No. G-M. 211-11-4.

ENCLOSURE No. one & Re 1/-.

Has the honor to forward herewith a Power-of-atto executed by Mr. Hugh Mackie Leslie of Glasgow, constituting Messrs H. H. & R. Remfry and G. H. G. Remfry of Calcutta, as Agents in respect of his invention for "Improvements in the extraction of ~~ore~~ metals from their ores," and to request that the same may be impressed with the Mysore Govt Stamps of the value of Rs one and returned to this

2. The sum of Re one is herewith forwarded.

By Order

29.1.12
for Secy.

GPB—10,000—9.11.06

30 50 / 3 1 Money & Cover (P.)
Ill
22/2/12

G.R.S. 29A] 4 885

(5)

190

From

Secy. to the Govt. of His Highness
The Maharaja of Mysore,
Genl. and Rev. Dept.

To

The Deputy Commr., Jrs Deptt
Bangalore Dt

Dated

Despatched 21. 2. 12

Received

General No. G 4359
No. G.R. 211-11-5

ENCLOSURE No. Rs 10/-

Has the honor to forward herewith a sum of Rs 10/- being the fee received from Messrs Remfry & Son, Calcutta, under cl (1) of Schedule IV of the Mysore Inventions and Designs Regns XI of 1894, in respect of an application for leave to file a specification of an invention for "Improvements in the extraction of metals from their ores" by Mr. Hugh Mackenzie Leslie of Glasgow, and to request the favor of an acknowledgment for the receipt of the amount.

By order,

29.1.12
For Secretary

15.4

GPB—~~15,000~~—9-4-06.

C.V. Book 1/2

(6

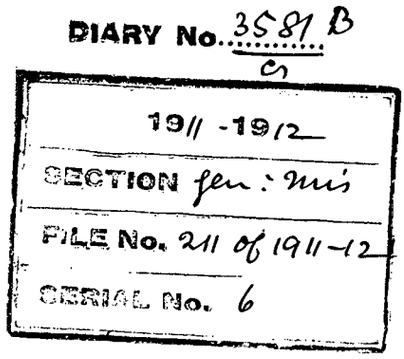
Copy of Docket No. 110, dated the 22nd Feb.y 1

from the Superintendent of Stamps.

His letter No. G 4358 and G 4351 &
Docket Gen 211-11-4 Gen 219-11-3

Has the honor to return herewith duly stam
the two Powers of Attorney received with the above
to request the favor of an acknowledgment.

(sd) N. Krishnasami Rao
Supdt of Stamps in Mysore



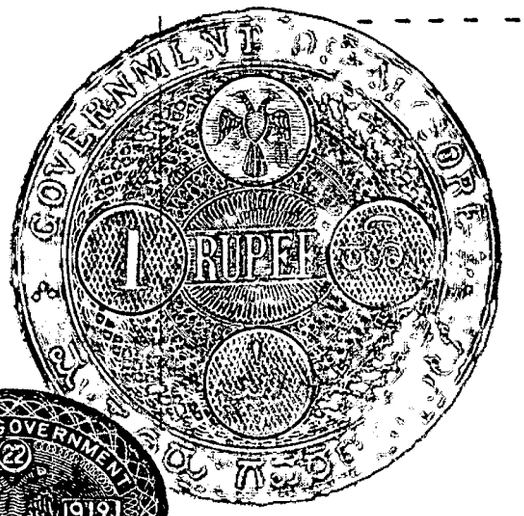
Enclosure to 826

(7

Case "B".

MYSORE.

POWER OF ATTORNEY.



IN THE MATTER of the Inventions and Designs Regulation 1894 of the Government of Mysore and in the matter of Hugh Mackenzie Leslie, Metallurgical Engineer, of 53 Waterloo Street, Glasgow, Scotland, an Inventor.

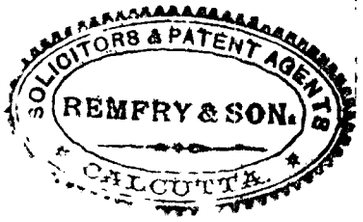
I, the abovenamed Hugh Mackenzie Leslie, do hereby retain, constitute and appoint Henry Hamilton Remfry and Rupert Remfry, Solicitors and Patent Agents, and Hamilton Greeves Remfry, Patent Agent, all of Calcutta, British India, jointly and severally; as my Agents and Attorneys to apply for and obtain from the Government of Mysore and keep in force an Exclusive Privilege or Letters Patent for "Improvements in the extraction of metals from their ores" and I authorise them to sign my name to such papers and writings and do such acts regarding the same, including the appointment of a substitute or substitutes as may be necessary or expedient.

Dated this 29th day of December 1911.

Signed, sealed and delivered
at Glasgow, Scotland, in the
presence of:- ....Hugh A Leslie.

Margaret Findlay Young.
94 Hope Street Glasgow Scotland. Typist

James Thomson.....
94 Hope Street Glasgow Scotland. Engineer



8

G.R.S. 29A]

29/2 190

From

The Asst **Secy. to the Govt. of His Highness**
The Maharaja of Mysore,
Genl. and Rev. Dept.

To

The Superintendent
of Stamps

Dated

Despatched 8th. 3. 12

Received

General No. G 4675
No. G.M. 211-11-7

ENCLOSURE No.

Has the honr to acknowledge the receipt, duly stamped of the Power-of-attorney executed by Hugh Mackenzie Leslie, forwarded with ~~his docket~~ the stamp supdt's No. 110 dated the 22nd Feby 1912.

By Order,

29-2-12
for Asst Secretary

VS. 41

GPB—10,000—9-4-06.

9

G/A

Rs 10 — Vouchd

Book No. 1014

No 44

Bangalore Treasury dated 23-2-12

Received from Secretary to the Govt of Inspn Genl & Rev Com

Rupees Ten only

Annas — and Pies — being on account of

application fee in respect of invention from

Messrs. Rensfry & Sons Calcutta. credit under A.R.

DIARY No. 3603

10/1-1912

SECTION for: Mis

211-11

In charge of Treasury.

Bangalore

A 8

10

Copy of letter No 1832, dated 30th March 1912, from the State Geologist in Mysore, to the Offg. Secretary to Govt, Genl & Rev. Deptss.

In reply to the marginally noted communications from your Office, I have the honor to forward herewith copy of letter No 653, dated 26th March 1912, from Mr. R. Bocquet, Inspector of Mines, on the subject of the applications for leave to file the specifications of certain inventions.

No.G. 4066/G.M.210-11-4, D/8.2.12
No.G.4550/G.M.219-11-2, D/ 21.2.12.
No. G. 4357/G.M.211-11-3, D/ 21.2.12.
N. G.4506/G.M.220-11-2, D/ 27.2.12.

2. The specifications received with your dockets referred to are herewith returned.

DIARY No. 4311

1911 -1912
SECTION Gen : Mis
FILE No. 211 of 04-12
SERIAL No. 9

Letter No 653, dated 26th March 1912, from Mr. R. Bod Esq., Inspector of Mines in Mysore, to Dr. W.F.Smeeth, M.A., Secretary to the Govt of H.H. the Maharaja of Mysore, Geological Department.

I have the honor to return herewith the following specifications of inventions:-

1. "Improvements in the treatment of ores by the Cyanide Process" by Mr. H.M.Leslie.

2. "Improvements in the extraction of metals from their ores" by Mr. H.M.Leslie.

3. 3. "Process for the pr ecipitation of precious metals from Cyanide solution" by Mr. I.M.Neil.

4. "Improvements in connection with furnaces for th direct production of iron and steel from iron ores" by Messrs. W.S.Simpson and H.Oviatt,

As far as I am aware there is nothing to prevent the applications for leave to file the above specifications from being granted.

C o p y

Sd/. B. Subba Rao,

For State Geologist in Mysore.

No 506 of 1911-12 (12) Enclosure to 89.

APPLICATION.

TO THE DEWAN OF MYSORE.

The Application of Hugh Mackenzie Leslie, Metallurgical Engineer, of 53 Waterloo Street, Glasgow, Scotland, for leave to file a Specification under Part I of the Mysore Inventions and Designs Regulation, 1894.

1. The Applicant is in possession of an invention for "Improvements in the extraction of metals from their ores"; he is the Inventor thereof and, to the best of his information and belief, the Invention is new within the meaning of Part I of the Mysore Inventions and Designs Regulation, 1894, and no circumstance exists which, if the Applicant is authorised to file a Specification and files it in accordance with that Part, will disentitle him to an Exclusive Privilege thereunder in respect of the Invention.

The Applicant has applied for a Patent in the United Kingdom in respect of this Invention No.28235 dated the 15th., day of December, 1911, See Illustrated Official Journal (Patents) No.1196 page 1772.

2. The following is a description of the Invention:-

SOLICITORS & PATENT AGENTS REMFRY & SON. CALCUTTA.

This invention relates to the Cyanide proc. of extracting metals from their ores and it has for it object to improve the same.

Under my invention I cover all, or as many as may be desired of the tanks, vats, extractor boxes, machines or places where Cyanogen compounds (Hydrogen Cyanide, Potassium or Sodium Cyanide or other Cyanide) in gas or solution are found, contained, or are used, in, or for, the process of extraction, in such a manner as to prevent the gases arising in these said places from evaporating or diffusing into the atmosphere it being a well known fact that a great loss of Cyanide occurs through the formation and evaporation of Hydrocyanic Acid in the process as at present carried out. From these covered places the gases are carried off (by suction or otherwise) and conducted to one or more regenerating vessels where they are subjected to the action of an alkaline hydrate or carbonate (preferably Caustic Soda or Potash, although in some cases, I may advantageously use Ammonium hydrate) and in this manner I fix the Hydrocyanic Acid in the gases. From the regenerating vessel or vessels the regenerated Cyanide solution is drawn off as required and added to the sump so as to strengthen the solution therein. Solution from the sump may be pumped to a reservoir from which solution is conducted, as required, to the vessel or vessels in which the ore pulp is undergoing treatment. In this manner it will be seen that the Hydrocyanic Acid gas which is continuously evolving during the process is not allowed to escape into the atmosphere but is continuously being regenerated into a simple Cyanide solution and continuously being re-used again in the treatment. In this manner the amount of Cyanide

the circulating pipe 8 and to strike the baffle cone 9 whereby it is distributed over the top of the charge. A continuous circulation is in this manner carried on. When the agitation has proceeded long enough it is stopped and the pulp is allowed to settle and the liquor is decanted off by the decantation pipes 10,11,12,13,14, and led to the filter B by the pipe 15. From thence it passes, by mean of the pipe 16. to the extractor C (where the metal is precipitated from the solution) and it then passes to the sump D by the pipe 17. The strength of the solution is kept up in the sump D by the addition thereto of regenerated Cyanide solution from the regenerator G through the pipes 18,19, 20 21. From the sump the solution can be pumped to the reservoir F by means of the pump E and the pipes 22, 23, and from the reservoir the solution is drawn off from time to time as required and supplied to the agitator A. The vessels A, B, C, D, and F are covered over and the gases evolved therein are conducted by the pipes 24, 25, 26, 27, 28, 29, to the regenerator G where the Hydrocyanic Acid is converted into a simple Cyanide by being brought intp contact with a suitable alkaline hydrate or carbonate such as Caustic Soda or Potash. The gas, after passing through the absorbing alkali and thus freed from its Hydrocyanic Acid, finds its way to the atmosphere by means of the pipe 32.

Each wash or liquor necessary for the treatment of the charge in A is treated in the same manner and when the metal has been extracted and the charge is ready for discharge, water is introduced from the water supply pipe 30, agitation is again started and the discharge valve at 31 is opened and the charge run to the waste dam.

The regenerator preferably consists of

closed tank divided into three compartments g^1, g^2, g^3, each compartment being filled, to the level a with, say, a solution of either Caustic Soda or Caustic Potash. The gases, evolved or given off during the Cyanide treatment and collected from the various covered places are conducted to the tank G by means of a pipe 29. The pipe 29 dips to near the bottom of the compartment g^1 and the gases pass up through the solution and collect at the top and pass again by the pipe 29^a into the compartment g^2 where they are subjected to the action of the solution in this compartment. The gases finally pass from the compartment g^2 to the compartment g^3 by the pipe 29^b and are subjected to the action of the solution for the third time. From the compartment g^3 they can pass off into the atmosphere (or elsewhere) by a pipe 32. The solution containing the regenerated Cyanide is drawn off as, and when required, by the pipes 18, 19, 20.

This invention is applicable to any of the known methods of treating ores by means of Cyanogen Compounds for the recovery of Metals, namely, Percolation, Agitation, Decantation, or other method whereby the metal is recovered by using a Cyanogen Compound and in which the Cyanogen Compound used is decomposed and liberates gas containing Hydrocyanic Acid.

Any number of combined agitators, pulp collectors and dewatering devices may be used, the number of filters, extractors, sumps, reservoirs pumps and regenerators being adapted to suit the requirements of the plant.

It is to be understood that I do not confine myself to the construction or arrangement of plant shown as this may obviously be changed or altered, for instance,

I may use one or more ordinary agitators or percolators instead of the combined agitator, pulp collector and dewatering device.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. The improvement in the Cyanide process for treating ores consisting in collecting or drawing off the gases liberated during the treatment and conducting them to one or more regenerating vessels wherein they are subjected to the action of an alkaline hydrate or carbonate so as to convert any Hydrocyanic Acid gas into a simple Cyanide solution which latter is drawn off and added to the sump and thereafter supplied either directly or indirectly to the vessel or vessels in which the ore pulp is undergoin treatment, substantially as described.

2. In the treatment of ores by the Cyanide process covering the vessels or places where the Cyanogen compounds in gas or solution are found, contained, or are used, in or for the process of extraction and carrying off the gases from these covered vessels or places and conducting them to one or more regenerating vessels where they are subjected to the action of an alkaline hydrate or carbonate so as to fix the Hydrocyanic Acid in the gases, the solution from the regenerating vessel or vessels being drawn off as required and added to the sump so as to strengthen the solution therein, the solution from the sump being pumped or conducted either directly or indirectly to the vessel or vessels in which the ore is undergoing treatment, the arrangement constituting a circulatory system whereby the Hydrocyanic Acid gas which is continuously evolving during the treatment is continuously being

regenerated into a simple Cyanide solution and continuously being re-used again in the treatment, substantially as described.

3. A plant for carrying out the Cyanide process for treating ores comprising, in combination, a combined pulp collector, agitator, and dewatering device, a filter, an extractor, and a regenerator the same being connected with the sump and either directly or indirectly with one another and all being covered over, the Hydrocyanic Acid gas liberated during the treatment being regenerated into a simple Cyanide solution and used over again, substantially as described.

3. The Applicant therefore applies for leave to file a Specification of the Invention pursuant to Part I of the Mysore Inventions and Designs Regulation, 1894.

Hugh A. Leslie.

I, the Applicant abovenamed, do declare that the facts stated in this Application are true to my knowledge, except as to matters stated on information and belief and as to those matters I believe them to be true

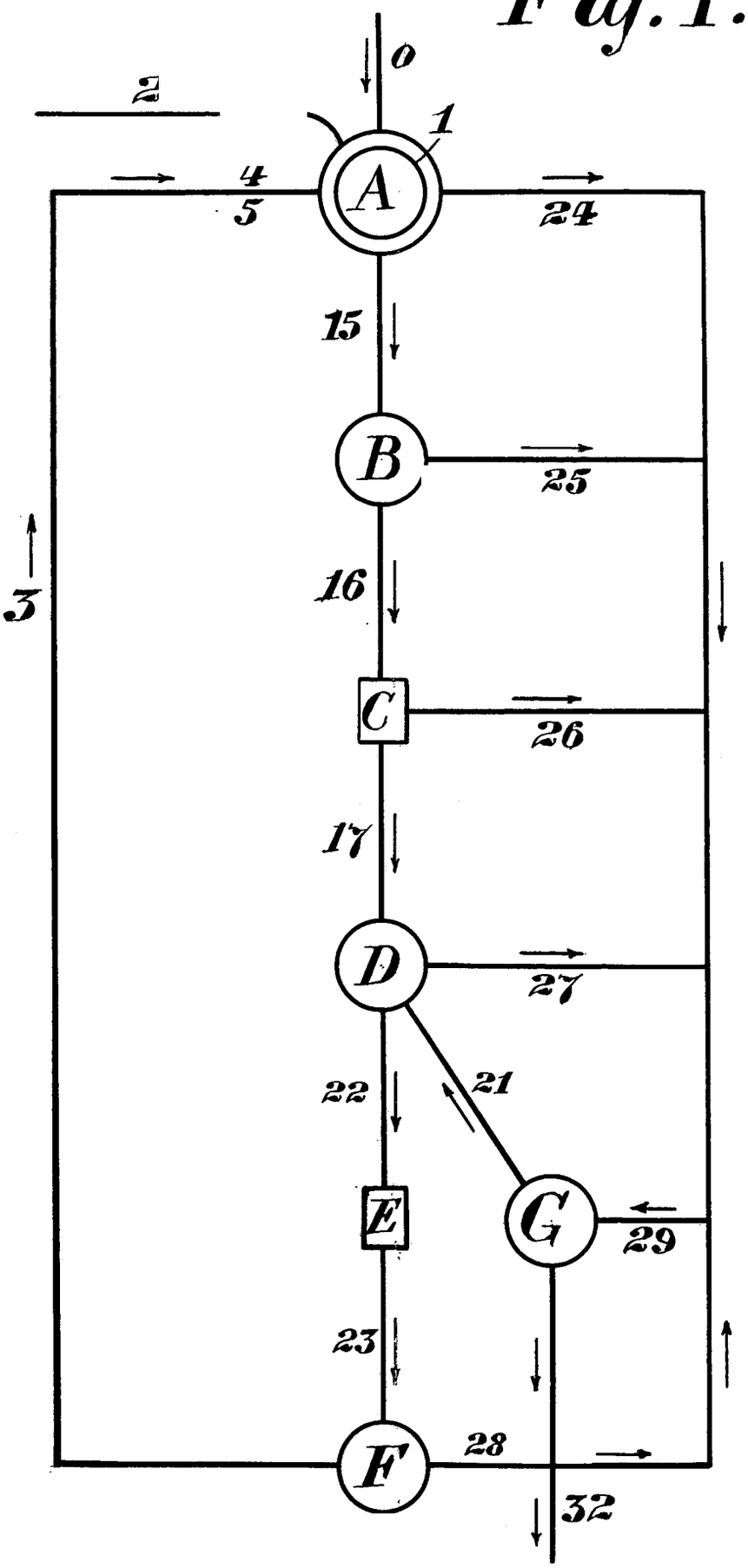
Dated this 20th day of December, 1911.

Hugh A. Leslie.

ase B or B'

20

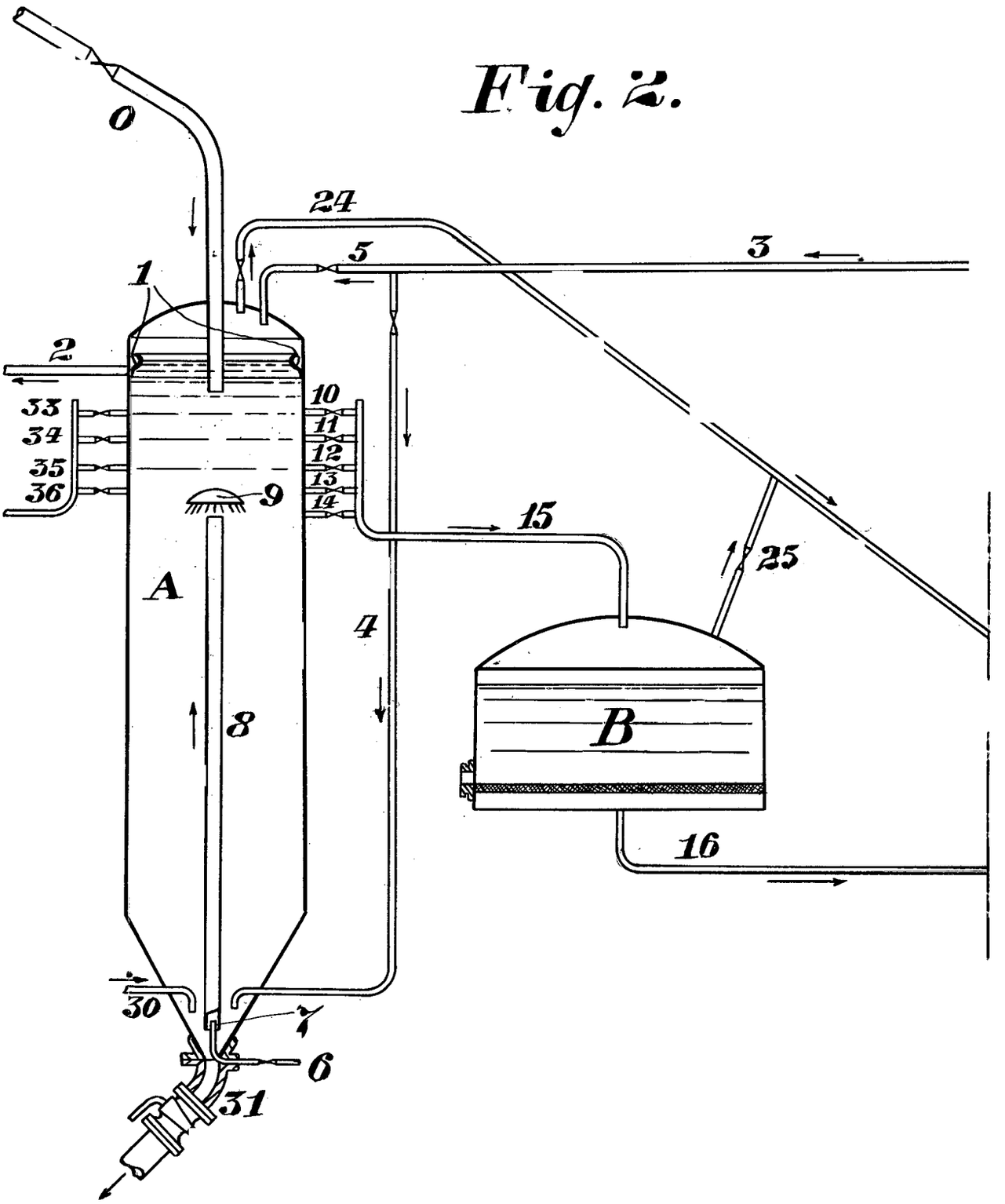
Fig. 1.



Case B or B-

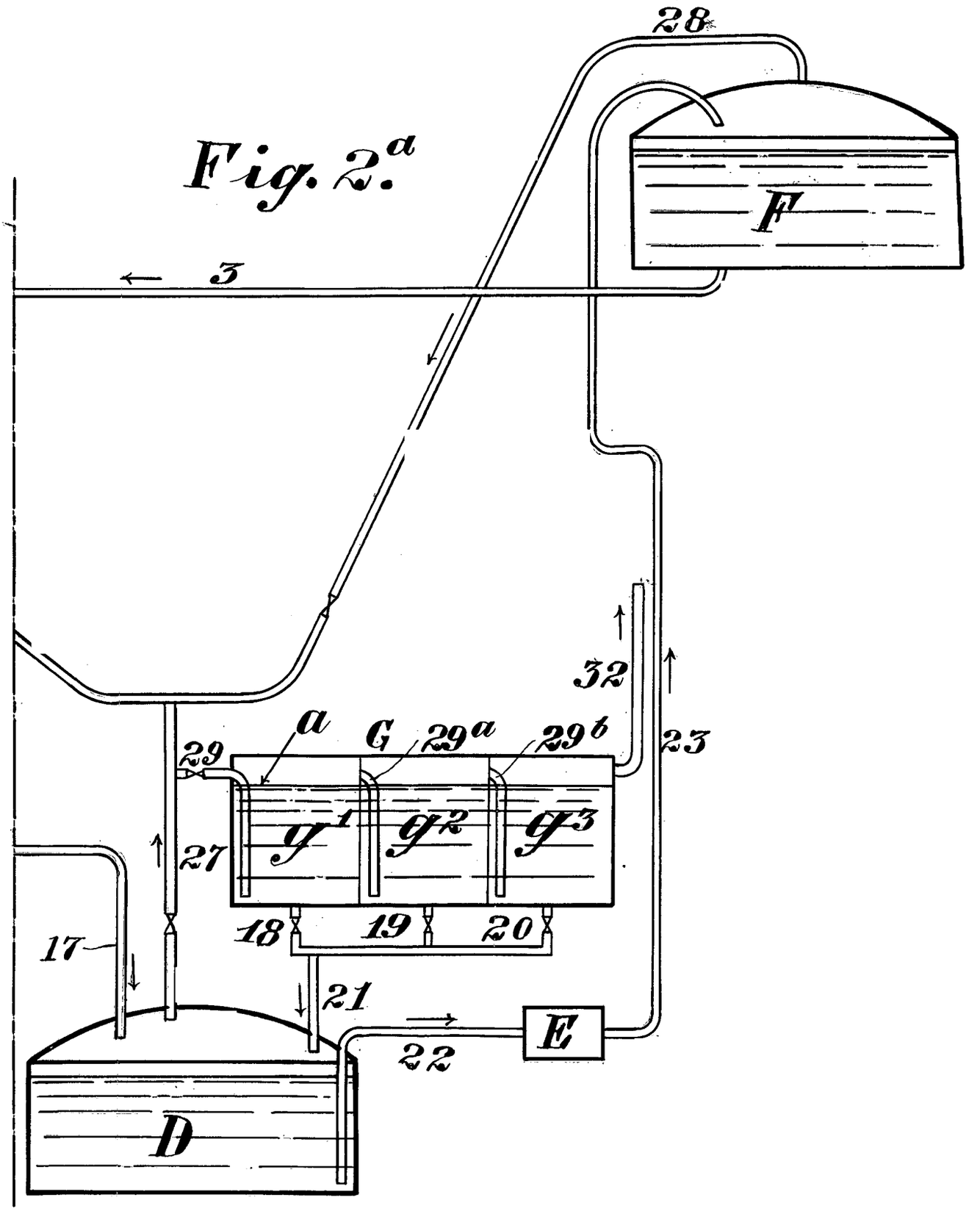
21

Fig. 2.



Case Bor 8 1/1

Fig. 2.a



GENERAL. V 1/3 4A/28 43

22)

To

THE ~~PATENT~~ SECRETARY, TO THE GOVERNMENT OF MYSORE,
~~PATENT OFFICE~~, REVENUE DEPARTMENT,
~~CALCUTTA~~. BANGALORE,
MYSORE.

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

DIARY No. 4752

1912-1913
SECTION Gen : Mis
FILE No. 211 Suppr 1911-12
SERIAL No. 10.

Dated CALCUTTA, the 26th February 1913.

Dept. P. File Lr. M.
FILE INDICATION.
Mysore Pats.

re H. M. LESLIE. (MYSORE) Case B.

In compliance with the request contained in your Letter No. G.4356/G.M. 211-11-2 dated 21st February 1912, we beg to submit herewith a Certified Copy of British printed Specification No. 28235/11, and solicit the favour of early orders upon this Application.

We have the honour to be,

Sir,

Your very obedient servants,

1 Enclo.

REMFRY & SON

I.M.B.

I Certify this, including the Drawing forming part thereof, to be a true Copy.

Enclosure to SE 10. [illegible]

Acting for Comptroller.

N° 28,235 A.D. 1911

Date of Application, 15th Dec., 1911—Accepted, 20th June, 1912

COMPLETE SPECIFICATION.

Improvements in the Extraction of Metals from their Ores.

I, HUGH MACKENZIE LESLIE, of 53, Waterloo Street, Glasgow, Metallurgical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the cyanide process of extracting metals from their ores and it has for its object to improve the same.

Under my invention I cover all, or as many as may be desired, of the tanks, vats, extractor boxes, machines or places where cyanogen compounds (hydrogen cyanide, potassium or sodium cyanide or other cyanide) in gas or solution are found, contained, or are used, in, or for, the process of extraction, in such a manner as to prevent the gases arising in these said places from evaporating or diffusing into the atmosphere it being a well known fact that a great loss of cyanide occurs through the formation and evaporation of hydrocyanic acid in the process as at present carried out. From these covered places the gases are carried off (by suction or otherwise) and conducted to one or more regenerating vessels where they are subjected to the action of an alkaline hydrate or carbonate (preferably caustic soda or potash, although, in some cases, I may advantageously use ammonium hydrate) and in this manner I fix the hydrocyanic acid in the gases. From the regenerating vessel or vessels the regenerated cyanide solution is drawn off as required and added to the sump so as to strengthen the solution therein. Solution from the sump may be pumped to a reservoir from which solution is conducted, as required, to the vessel or vessels in which the ore pulp is undergoing treatment. In this manner it will be seen that the hydrocyanic acid gas which is continuously evolving during the process is not allowed to escape into the atmosphere but is continuously being regenerated into a simple cyanide solution and continuously being re-used again in the treatment. In this manner the amount of cyanide required is very much reduced from present practice as practically very little loss of cyanide will take place, any of the cyanogen radical in the cyanide that is converted into hydrocyanic acid being re-converted and used over again this conversion and re-conversion going on automatically over and over again so long as the process is carried on.

The invention also includes improvements in the construction and arrangement of the plant.

In order that the invention may be clearly understood I have hereunto appended, simply by way of illustration or example, drawings showing diagrammatically a convenient construction of plant for carrying out the improved process.

Fig. 1 is a plan and Fig. 2 an elevation of a single unit, of which there may be several in the plant.

Referring to the drawings:—

The ore pulp from the mill is conducted by pipe 0 to a combined pulp collector, dewatering device and agitator A in which the pulp is allowed to settle, the overflow water and slime being carried off to the slimes plant by means of the overflow circular launder 1 and the overflow pipe 2 and when the

[Price 8d.]

agitator A is sufficiently full the pulp feed is directed to another agitator similar to A, A being the first unit of the treatment plant. The surplus water is decanted off by means of the decanting pipes 33, 34, 35, 36, which carry the same to the slimes plant (not shown). Cyanide solution is introduced from the reservoir F by means of the pipes 3, 4, and 5 and then agitation is started by turning on the usual compressed air supply from the pipe 6, which latter is connected to the nozzle 7, thus causing the liquor and pulp to rise through the circulating pipe 8 and to strike the baffle cone 9 whereby it is distributed over the top of the charge. A continuous circulation is in this manner carried on. When the agitation has proceeded long enough it is stopped and the pulp is allowed to settle and the liquor is decanted off by the decantation pipes 10, 11, 12, 13, 14, and led to the filter B by the pipe 15. From thence it passes, by means of the pipe 16, to the extractor C (where the metal is precipitated from the solution) and it then passes to the sump D by the pipe 17. The strength of the solution is kept up in the sump D by the addition thereto of regenerated cyanide solution from the regenerator G through the pipes 18, 19, 20, 21. From the sump the solution can be pumped to the reservoir F by means of the pump E and the pipes 22, 23, and from the reservoir the solution is drawn off from time to time as required and supplied to the agitator A. The vessels A, B, C, D, and F are covered over and the gases evolved therein are conducted by the pipes 24, 25, 26, 27, 28, 29, to the regenerator G where the hydrocyanic acid is converted into a simple cyanide by being brought into contact with a suitable alkaline hydrate or carbonate such as caustic soda or potash. The gas after passing through the absorbing alkali and thus freed from its hydrocyanic acid finds its way to the atmosphere by means of the pipe 32.

Each wash or liquor necessary for the treatment of the charge in A is treated in the same manner and when the metal has been extracted and the charge ready for discharge, water is introduced from the water supply pipe 30, agitation is again started and the discharge valve at 31 is opened and the charge run to the waste dam.

The regenerator preferably consists of a closed tank divided into three compartments g^1, g^2, g^3, each compartment being filled, to the level a, with, say, a solution of either caustic soda, or caustic potash. The gases, evolved or given off during the cyanide treatment and collected from the various covered places are conducted to the tank G by means of a pipe 29. The pipe 29 dips to near the bottom of the compartment g^1 and the gases pass up through the solution and collect at the top and pass again by the pipe 29^a into the compartment g^2 where they are subjected to the action of the solution in this compartment. The gases finally pass from the compartment g^2 to the compartment g^3 by the pipe 29^b and are subjected to the action of the solution for the third time. From the compartment g^3 they can pass off into the atmosphere (or elsewhere) by a pipe 32. The solution containing the regenerated cyanide is drawn off as, and when required, by the pipes 18, 19, 20.

If desired the reservoir F may be dispensed with and the solution be pumped direct from the sump D to the agitator A.

This invention is applicable to any of the known methods of treating ores by means of cyanogen compounds for the recovery of metals, namely, percolation, agitation, decantation, or other method whereby the metal is recovered by using a cyanogen compound and in which the cyanogen compound used is decomposed and liberates gas containing hydrocyanic acid.

Any number of combined agitators, pulp collectors and dewatering devices may be used, the number of filters, extractors, sumps, reservoirs, pumps and regenerators being adapted to suit the requirements of the plant.

It is to be understood that I do not confine myself to the construction or arrangement of plant shown as this may obviously be changed or altered, for instance, I may use one or more ordinary agitators or percolators instead of the combined agitator, pulp collector and dewatering device A.

Leslie's Improvements in the Extraction of Metals from their Ores.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In the treatment of ores by the cyanide process covering the vessels or places (the agitator, filter, extractor, *etc.*) where the cyanogen compounds in gas or solution are found, contained, or are used, in or for the process of extraction and carrying off the gases from these covered vessels or places and conducting them to one or more regenerating vessels where they are subjected to the action of an alkaline hydrate or carbonate so as to fix the hydrocyanic acid in the gases, the solution from the regenerating vessel or vessels being drawn off as required and added to the sump so as to strengthen the solution therein, the solution from the sump being pumped either directly or indirectly to the vessel or vessels in which the ore is undergoing treatment, the arrangement constituting a circulatory system whereby the hydrocyanic acid gas which is continuously evolving during the treatment is continuously being regenerated into a simple cyanide solution and continuously being re-used again in the treatment, substantially as described.

2. A plant for carrying out the cyanide process for treating ores comprising, in combination, a combined pulp collector, agitator, and dewatering device, a filter, an extractor, and a regenerator the same being connected with the sump and either directly or indirectly with one another and all being covered over, the hydrocyanic acid gas liberated during the treatment being regenerated into a simple cyanide solution and used over again, substantially as described.

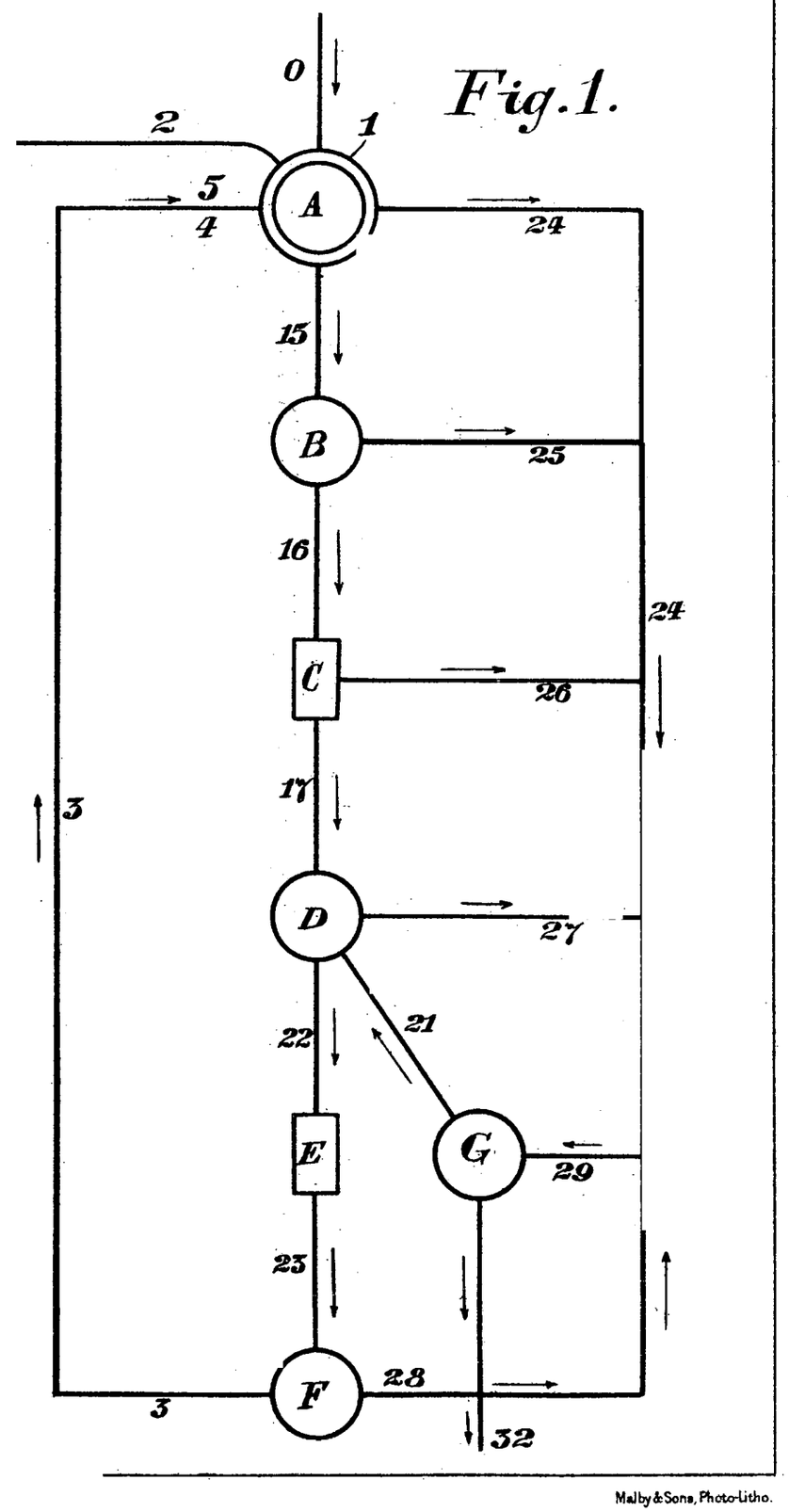
Dated this 14th. day of December, 1911.

H. D. FITZPATRICK & Co.,
Chartered Patent Agents,
94, Hope Street, Glasgow.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1912.

[This Drawing is a reproduction of the Original on a reduced scale.]

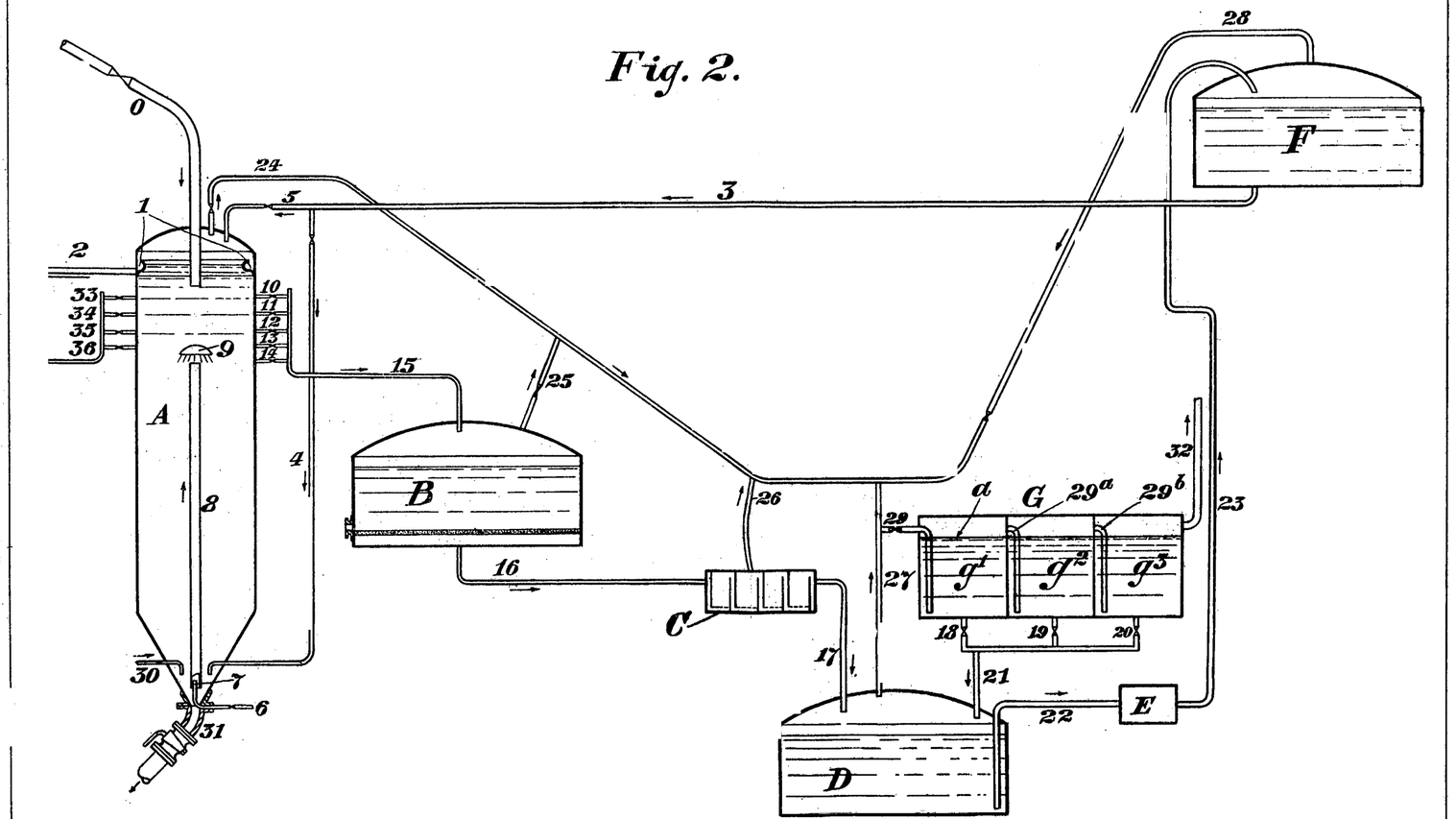
Fig. 1.



Malby & Sons, Photo-Litho.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 2.



Maltby & Sons, Photo-Litho.

28

N° G. 5616/G.M. 211-11-11

GOVERNMENT OF MYSORE

General Department.

Register No. 5 **of 19**11-12

Bangalore, the 18 March 1913.

WHEREAS an application, dated the 20th December 1911 and received on the 22nd January 1912, has been submitted under Section 5 of the Mysore Inventions and Designs Regulation, 1894, by Mr. Hugh Mackenzie Leslie, Metallurgical Engineer, of 53, Waterloo Street, Glasgow, Scotland,

(hereinafter referred to as "the applicant") for leave to file a specification of an invention for "Improvements in the extraction of metals from their ores"

And whereas the applicant has duly complied with all the requirements of Section 5 of the said Regulation;

The Government of Mysore are pleased, under Section 6 of the said Regulation, to authorize the applicant to file a specification of the said invention in accordance with the provisions of the said Regulation.

ORDERED, that the applicant be, and he is hereby, informed accordingly.

By Order of the Government of Mysore,

Draft) 18/3/13.

for *Secretary to the Govt. of Mysore,*
Gen. and Rev. Depts.

Certified that the fees prescribed in the fourth schedule to the Mysore Inventions and Designs Regulation, 1894, in respect of the application for leave to file the said specification and of the filing thereof have been paid by the applicant, and that the specification hereinbefore described has been duly filed in accordance with the provisions of Section 8 of the said Regulation on this the Thirty first day of May 1913.

Draft)

for *Secretary to the Govt. of Mysore,*
Gen. and Rev. Depts.

(Section 8 of the Inventions and Designs Regulation, 1894.)

8. (1) If within six months from the date of an order under Section 6, Sub-Section (1), or within such further time, not exceeding three months, as the Government of Mysore, in its discretion, may, on cause shown to its satisfaction and on payment of the fee prescribed in that behalf in the fourth schedule, see fit to allow, the applicant causes a specification of his invention to be filed in manner by this Part required, and the fee prescribed in the fourth schedule in respect of the filing of the specification to be paid, the applicant shall, subject to the other provisions of this Part, be entitled to the exclusive privilege of making, selling and using the invention in the Territories of Mysore, and of authorizing others so to do, for a term of fourteen years from the date of the filing of the specification.

(2) But an exclusive privilege in respect of an invention of a new manufacture shall, notwithstanding anything in Sub-Section (1), cease, if the inventor fails to pay, within the time limited in that behalf by the fourth schedule, any fee prescribed in that schedule in respect of the continuance of the privilege.

(3) If, nevertheless, in any case, by accident, mistake, or inadvertence, an inventor fails to pay any such fee within the time so limited, he may apply to the Government of Mysore for an enlargement of the time for making the payment.

(4) Thereupon the Government of Mysore may enlarge the time accordingly, on payment of the fee prescribed in that behalf in the fourth schedule, and subject to the following conditions, namely :—

(*a*) the time for making a payment shall not in any case be enlarged for more than three months ; and

(*b*) if any suit is instituted in respect of an infringement of the exclusive privilege committed after a failure to make a payment within the time limited for the making thereof and before the enlargement of that time, the Court disposing of the suit may, if it thinks fit, refuse to award or give any damages in respect of the infringement.

GPB—500—7-4-09.

2v

18/3/13 2865

29

G. R. S. 26]

gen File No. 211-11

Serial No. 12

Diary No. of letter replied to 4752

No. G. 5617 (E.1)

General and Revenue Secretariat

( )

, *the* 191 .

To

Messrs Remfry & Son,

Solicitors & Patent Agents, Calcutta

Date of issue 18. 3. 13

Gentlemen,

Signed by Mr B Ramaswamia

With reference to correce endnig with your letter of the 26th Febry 1913, I am directed to forward herewith G.O. no. G. 5616 gen 211-11-11 of the 18th March 1913, authorising Mr Hugh Mackenzie Leslie, Metallurgical Engineer of 53 Waterloo St, Glasgow, to file a specification of his invention for "Improvements in the extraction of metals from their ore

over.

SUBJECT.

30

and to request that the same may be communicated to the party concerned.

I have &c,

18/7/13.

For Off. Secretary.

List of enclosures.

Copied by KR 14/7

Examined by

GPB—25,000—8-8-11.

DIARY No. 6441

GENERAL. V/18/Gen WA 69/51 A-50

831

1912-1913
SECTION Gen: mis
FILE No. 211 of 1911-12
SERIAL No. 13

REGISTERED.

To

THE ~~PATENT~~ SECRETARY, TO THE GOVERNMENT OF MYSORE,
~~PATENT OFFICE~~, GENL. & REV. DEPTS.,
~~CALCUTTA~~. BANGALORE,
MYSORE.

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA,

Dated CALCUTTA, the 13th May 1913.

S

Dept. P. File Lr. M.
FILE INDICATION.
Mysore Pats.

re H. M. LESLIE. (CASE B) MYSORE
No. 5 of 1911-12.

Pursuant to the Order granting leave in this matter dated 18th March 1913, Register No. 5 of 1911-12, we have the honour to forward herewith 4 copies of the Specification of HUGH MACKENZIE LESLIE, Metallurgical Engineer, of 53 Waterloo Street, Glasgow, Scotland, in respect of his Invention for "IMPROVEMENTS IN THE EXTRACTION OF METALS FROM THEIR ORES".

The abovementioned Order is enclosed and we solicit the favour of your filling to the Certificate at foot thereof and having same signed.

A Post Office Order for Rs. 30/- is sent to-day.

We have the honour to name our Office in Calcutta as the Address for Service under the Act.

We have the honour to be,
Sir,
Your very obedient servants,

REMFRY & SON

Bk.Post.
4 Specns.

I.M.B.

1,000.—17-3-11.

32

DUPON. The remitter may write here any communication to the payee.

30 As. re H.M.Leslie. Case B.

Mysore No. 5/11-12

(As per letter of date)

REMFRY & SON

Remitter

15/5/13

To B. D

W/

15/5

Remitter

B T

W

7/6/13

MYSORE GOVT. GEN. & REV. SECRETARIAT,

No. G. 7859

Dated Bangalore, ...6th June... 1913.

G.m. 211-12-14

NOTIFICATION.

(PATENT.)

The following specification of an invention has been filed in accordance with Sections 8, 9, 10 and 11 of Regulation XI of 1894 (The Inventions and Designs Regulations) and is open to inspection at the Mysore Government Secretariat on application to the Secretary to the Government of His Highness the Maharaja of Mysore, General and Revenue Departments, and on payment of a fee of one Rupee.

By Mr. Hugh Mackenzie Leslie, Metallurgical Engineer, of 53, Waterloo Street, Glasgow, Scotland

"Improvements in the extraction of metals from their ores"

By Order,

Jr Secretary.

To

The Compiler *Mysore Gazette,* for publication.

GPB—500—23-7-06.

4865/1913

34

No. G. 7860 16.2
G.M 211-11-15

MYSORE GOVT. GEN. & REV. SECRETARIAT,
Dated Bangalore, 6th June 1913.

From

The Secretary to the Government of H. H. the Maharaja of Mysore,
General and Revenue Departments.

To

Messrs Remfry & Son,
Solicitors and Patent Agents,
Calcutta.

~~Sir,~~ Gentlemen

With reference to your letter dated the 7th May 1913, I am directed to forward copy of a Notification No. G7859/G.M 211-11-14 dated 6th June 13. issued by this Government in regard to the invention filed by you under Regulation XI of 1894 (The Inventions and Designs Regulations.) and I request that the fact may be communicated to the party concerned.

The order granting permission to file specification is herewith returned, with the certificate at foot, duly filled in and signed.

I have the honor to be,
~~Sir,~~ Gentlemen
Your most obedient servant,

S/ [illegible]

for *Secretary.*

4½ Encl
2 Rs 8 as
Cash
7/6

16/5/13

G.R.S. 29A] 4 Diff 35

190 .

From

Secy. to the Govt. of His Highness the Maharaja of Mysore, Genl. and Rev. Dept.

To

The Deputy Comm^r,
Treasury Deptt
Bangalore Dt

Dated

Despatched 6th June 13.

Received

General No. G. 7861

No. G.M-211-11-16.

Enclosure No. with Rs 30/

Has the honor to forward herewith the sum of Rs: (thirty only) received from Mr Rentzy & Son, Calcutta, being the fee payable under Schedule IV, Clause 2 of the Mysore Inventions and Designs Regulation No. XI of 1894 for filing a specification of Mr Hugh Mackenzie Leslies invention for "Improvements in the extraction of Metals from their ores" and requests the favor of an acknowledgment for the receipt of the amount.

By Order,

for Secretary

MGCPT—20,000—16-2-05.

2/6/17 4 845

G.R.S. 29A] 36

190

From

Secy. to the Govt. of His Highness the Maharaja of Mysore, Genl. and Rev. Dept.

To
(1) The State Geologist in Mysore
(2) " Supdt, Govt Museum.
(3) " Chief Engineer -

Dated

Despatched 6th June 17

Received

General No. G. 7862-4
No. G.M. 211-11-17
Enclosure No. 1 each.

Has the honor to forward herewith for record in his Office copy of a specification of an invention for "improvements in the extraction of metals from their ores" by Mr Hugh Mackenzie Leslie of Glasgow, Scotland, and to request the favor of an acknowledgment.

By order,

S M

For Secretary

MGCPT—20,000—16-2-05.

DIARY NO. 6910

Book No. 1044

Rs 30/-

Bangalore Treasury dated 2-6-13

Received from Secretary to the Govt of Mysore Legislative Department

Rupees Thirty only

Annas — and Pies — being on account of

fee in respect of an invention under his application No 7861 of 1913

Dated 21-11-16

In charge of Treasury.

Bangalore

Noted. 20/6/17

11/6

DIARY No. 6916

38

M.G.D. 13]

1912-1913
SECTION Geo: Mis
FILE No. 211 of 1911-12
SERIAL No. 19

MYSORE GEOLOGICAL DEPARTMENT,

DATED BANGALORE, 12 June 1913

No. 2897

FROM

DR. W. F. SMEETH, M.A., D.Sc., A.R.S.M., etc.,
State Geologist in Mysore.

To

K.R. Srinivasa Iyengar, Esquire, M.A.,
Secretary to the Govemment of His Highness
the Maharaja of Mysore, General & Revenue Depts:
BANGALORE.

SIR,

I have the honour to acknowledge, with thanks, the receipt of a copy of a specification of an invention for "Improvements in the extraction of metals from their ores" by Mr. Hugh Mackenzie Leslie of Glasgow, Scotland, forwarded with your docket No. G. 7862-4/G.M. 211-11-17. dated the 6th June 1913.

I have the honour to be,
Sir,
Your most obedient servant,

Registrar
for State Geologist in Mysore.

GPB-300-28-3-13

DIARY No. 6933

1912-1913
SECTION Gen: Mis
FILE No. 211 of 1911-12
SERIAL No. 20

34

No. 385

OFFICE OF ECONOMIC BOTANIST,
SUPERINTENDENT, MYSORE GOVERNMENT MUSEUM

Bangalore, dated 6th June 1913

FROM

G. H. KRUMBIEGEL, ESQ., F.R.H.S.,
Economic Botanist,
Superintendent, Mysore Govt. Museum,
Bangalore.

To

The Secretary to the Govt. of
the Maharaja of Mysore
Gen. and Rev. Dept.

Sir,

I have the honor to acknowledge
receipt of a Copy of the specification
of an invention for "Improvements
in the Extraction of metals from their
Ores" by Mr. A. M. Leslie of Glasgow
forwarded with your docket
G. 7862-4/G.M. 211-11-12 dated 6th June 1913.

I have the honor to be,
Sir,
Your most obedient servant,

G. H. Krumbiegel
Superintendent,
Govt. Museum

1903

V 106

From V 1912-13

G. H. KRUMBIEGEL, Esq., F.R.H.S.,
Economic Botanist,
Supt., Mysore Govt. Museum,
Bangalore.

To The Secretary to the Govt. of
H.H. the maharaja of Mysore.
Gen. and Rev. Depth

Dated 6th June 1913.

Despatched 9th —.. —

Received

General No. 303

No.

Enclosure No.

Acknowledging receipt of
a copy of specification of a
an invention for "Improvements
in the Extraction of metals from
their ores" by Mr. H. M. Leslie.

GPB—5,76,000—6-4-12

40

No. 5564

MYSORE P. W. DEPARTMENT,

CENTRAL OFFICE.

Bangalore, 11th July *191* 3.

From

KARPUR SHRINIVASRAV, ESQ., B.Sc., L.C.E.,

Offg. Chief Engineer of Mysore,

Bangalore.

DIARY No. 326
19/3-1914
SECTION Gen. Misc.
LC No. 211-11
No. 21.

To

K.R.Srinivasaiengar, Esq., M.A.,

Secretary to the Government of

His Highness the Maharaja of Mysore,

General and Revenue Departments.

Sir,

I have the honour to acknowledge with thanks, the - - receipt of a copy of specification of an invention for "Improvements in the extraction of metals from their ores" by Mr.Hugh Mackenzie Leslie of Glasgow, Scotland, received with your memo No. G.7862-4/G.M.211-11-17 dated the 6th June 1913.

I have the honour to be,

Sir,

Your most obedient servant,

H. Srinivasrao

Deputy Chief Engineer,

Mysore P.W.Department.

S.S.

U 13/7 [illegible]

1913.

MYSORE P. W. DEPARTMENT.

No. 5-564

From

THE CHIEF ENGINEER OF MYSORE,
Bangalore.

To The Secretary to Govt.,
General & Revenue Depts
Bangalore.

Dated Bangalore 11 July 1913.

Despatched

Enclosure No.

SUBJECT.

Acknowledging the receipt of a copy of a specification of an invention for "Improvements in the Extraction of Metals from their Ores," by Mr. Hugh Mackenzie Leslie of Glasgow, Scotland.

GPB—2,000—1-413